

## Value-Added Manufacturing—An Important Link to the Larger U.S. Economy

*The value of raw materials in agricultural- and wood-based products represents only a fraction of each dollar paid by the consumer for these products. Activities that add value to raw inputs are an important link between agriculture, forestry, and the broader economy.*

**T**his Rural Industries issue of *Rural Conditions and Trends* is devoted to analyses of farm- and forest-related manufacturing. Adding value to locally grown farm and forest products through processing and marketing activities is a popular approach to revitalizing rural communities. Federal and State agencies have shown considerable interest in helping communities implement “value-added” economic development efforts. However, little research and analysis is available to policymakers, community leaders, and economic development practitioners who are designing and evaluating “value-added” development strategies. This issue of *Rural Conditions and Trends* is intended to fill this need.

In this issue we report on manufacturing industries that rely on farm or forest products for a substantial portion of their material inputs (excluding labor, capital, and services). Using Department of Commerce data on interindustry transactions, we identified a set of manufacturing industries that obtain at least 20 percent of their inputs from farm or forest products, either directly from the farm or forestry/logging industries or indirectly through early-stage processors or wholesalers (see appendix 2 “Definitions”). We refer to this selected group of farm- and forest-based manufacturers as “value-added manufacturers.” Technically, all manufacturing industries are “value-added manufacturers,” because all add value to their material inputs. For the sake of simplicity, when we refer to “value-added manufacturers” in this issue, it is understood that we are referring to manufacturers that rely on farm- and forest-based materials.

The articles in this issue look at various aspects of these industries and the demand for their products. Trends in industrial production show that most value-added sectors are growing at a moderate rate, but tobacco and leather products are stagnant or declining. Geographic patterns of job growth and plant location indicate that value-added industries are a growing source of rural jobs and that value-added establishments have increasingly chosen rural locations during the 1990's. Lower rural labor costs may be one of the factors attracting value-added manufacturers. Rural nonmetro value-added workers earn about 20 percent less than their urban counterparts. Value-added industries rely more on low-skill, male, and Hispanic workers than do other manufacturing industries. Wages are lower in value-added industries than they are in other manufacturing, a reflection of the low skill requirements and relatively few professional and technical workers. Value-added industries support additional economic activity in their local area by purchasing raw materials locally. Analyses of capital use by value-added manufacturers show that food, tobacco, and paper manufacturers are among the more capital-intensive manufacturing businesses, while manufacturers of lumber, other basic wood products, and leather products use much less capital per worker. Recent levels of capital investment are consistent with the moderate growth during the 1990's shown by production indexes. Analysis of capital investment decisions by individual value-added businesses shows that expansion of productive capacity is the most frequently cited reason for undertaking investment plans. Most value-added manufacturers used internally generated funds or bank loans to finance their investment plans, and most did not have difficulty arranging outside financing. Exports are an important component of the demand for value-added manufacturers' products, and value-added exports support over 90,000 U.S. jobs. Holding aside the effects of fluctuations in international financial markets, trade liberalization as a result of the Uruguay Round of the General Agreement on Tariffs and Trade should expand markets for many value-added products.

In summary, farm- and forest-based value-added industries have potential to bring additional economic growth to rural areas rich in agricultural and forest resources. Low labor costs and access to raw materials at rural locations are attractive to value-added processors. Less stringent environmental regulations and lower taxes may also attract plants to rural areas. Community leaders should be aware that jobs in value-added industry are

relatively low in skill and educational requirements (see Michael J. Broadway, "Hogtowns and Rural Development," *Rural Development Perspectives* vol. 9, no.1, February 1994). Value-added jobs generally pay less than jobs in other manufacturing industries, but more than jobs in food service and retail trade.

Value-added industries are growing and expanding productive capacity, but not as fast as some other industries that also have a strong presence in rural areas, such as industrial machinery, transportation, and electrical equipment. The value-added development strategy may be best-suited for rural communities that are rich in natural resources, but lack easy access to customers, skilled work force, natural amenities, infrastructure, or "the critical mass" of related firms needed to attract businesses in faster growing industries.

In addition to our analysis of value-added industries, this issue also includes a special appendix to serve the needs of those readers who rely on Rural Conditions and Trends for the latest estimates of employment and earnings in all industries. Farm and farm-related employment and food and fiber employment estimates first published last year have been updated to more recent years and appear in the second special appendix. Estimates of economic activity generated by exports of bulk and processed agricultural products (published in previous years in ERS' Foreign Agricultural Trade of the United States series of reports) appear in the last appendix in this issue.

### **Most of the Consumer Dollar Goes to Value-Added Activities**

Value added is defined as the difference between the final value of products and the value of the materials and inputs used to manufacture them. Value is added to raw materials by processing, refining, manufacturing, transporting, grading, assembling, packaging, and delivering products in a form that satisfies consumers' wants. The value added at each stage (farm, manufacturing, wholesale, transportation, and retail/food service) equals payments to factors of production (wages and salaries, dividends and interest, rent, and payment for services from other businesses). Labor costs are the largest component of value added, accounting for about 47 cents of each dollar added to farm products beyond the farm gate. The Food and Fiber System and farm and farm-related employment (FFRE) estimates reported in this issue demonstrate that value-added activities are an important link between production agriculture and the larger U.S. economy (app. tables 10, 11, and 12). Farm production, fisheries, forestry, and agricultural services account for only 2 percent of U.S. jobs, but the broader measure of FFRE indicates that 15 percent of jobs have a link to agriculture.

The value of raw materials, such as wheat, corn, livestock, cotton, and logs, typically represents only a small fraction of each dollar spent on consumer products made from agricultural and forest products. For example, the farm value of U.S.-grown food commodities represented 21 cents of each consumer dollar spent on food products in 1994 (similar statistics for wood products are not available). The share is much smaller for manufactured products like breakfast cereals and cigarettes.

Value-added beyond the farm gate has grown steadily, while farm receipts have grown more slowly. The farm share of the consumer food dollar fell from roughly one-third in the early 1970's to 21 percent in 1994. (Comparable statistics are unavailable for the wood products sector, but trends appear to be similar.) Much value-added activity occurs in urban areas. At the same time, more farm dollars appear to be bypassing small rural communities. As the number of people living on farms has fallen, many retail, service, farm-input, and marketing businesses have closed in far-flung small towns. As a result, farm families are more likely to spend their income in larger towns and cities. A large share of interest and rental payments in the increasingly capital-intensive farm sector may also go to individuals and businesses outside the local community. These trends have encouraged communities to adopt value-added development strategies as a means of revitalizing their economies.

### Focus on Value-Added Manufacturing

In this issue, we focus on manufacturing activities that process agricultural raw materials, the type of value-added activity most likely to locate in rural areas. Retail, wholesale, transportation, and service activities generate more value-added than does manufacturing (see Food and Fiber System estimates of value-added by sector), but these activities tend to be located in urban areas near consumers. Direct farm marketing and agricultural tourism are an increasingly popular means of bringing retail and service value-added to rural areas (Fred Gale, "Direct Farm Marketing as a Rural Development Tool," *Rural Development Perspectives*, vol. 12, no. 2, pp. 19-25).

Economists have distinguished between "traditional" and "innovative" value-added activities. Traditional activities include flour-milling, meat packing, traditional bulk wholesaling, retailing, and farmers' markets. These activities are often mature industries, where the location of activity is long-established and determined by comparative advantage (the relative efficiency of producing a product in a particular region, determined by the region's labor cost, endowment of natural resources, and other factors). Recently, new farmers' markets have been established in many nontraditional urban locations and comparative advantage has changed in some industries. Red meat packing has shifted from urban to rural locations, and the pork industry has moved from the upper Midwest to the Southeast. Milk production and processing is shifting from the upper Midwest to Western States, and further shifts may occur if the current system of milk marketing orders is abolished.

Much of the attention has been focused on innovative value-added activities (direct marketing, onfarm recreation, biotechnology), industrial uses for agricultural and forest products (such as ethanol and soy-based inks), and nontraditional crops (such as crambe and kenaf) that can be used as industrial inputs. These activities are usually so specialized that they are not measured separately in statistics on businesses published by the Bureau of the Census and other Government agencies. Because we rely upon these statistics for much of our analysis, this issue will deal with broader statistical categories, which are often dominated by traditional value-added businesses.

Many manufacturing industries use inputs derived from agricultural and forest products. Besides food, tobacco, lumber, and paper industries, the chemical and textile industries each used over \$5 billion of agriculturally derived materials in 1992 (See *Industrial Uses of Agricultural Materials Situation and Outlook Report*, IUS-7, July 1997). The furniture industry used over \$4 billion, rubber and miscellaneous plastics and leather industries used between \$2 and \$3 billion, and the electrical equipment, stone, clay, and glass, apparel, and miscellaneous manufacturing industries each used over \$1 billion of agriculturally derived materials. We have analyzed trends only for industries where agricultural and forest products make up at least 20 percent of material inputs (see appendix 2, "Definitions"). This delineation of industries is based on the four-digit Standard Industrial Classification (SIC) codes, but some data are available only for less detailed two- or three-digit codes. Therefore industries classified as value-added vary somewhat among articles. [Fred Gale, 202-694-5349, [fgale@econ.ag.gov](mailto:fgale@econ.ag.gov)]